CERTIFICATION

I, Yukie KOJO, of 1-2-16 Tennou, Ichinomiya-shi, Aichi-ken, 491-0046, Japan, accompanying certified copy of the documents in respect of an application for a patent filed in Japan on the 28 day of January, 1998 and of the official certificate attached thereto, and certify that the following is a true and correct translation to the best of my knowledge and belief.

Yukie Kojo

Dated this 2 day of May, 2003

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PATENT OFFICE

JAPANESE GOVERNMENT

This is to certify that the annexed is a true copy of the following application as filed with this office.

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[Document] Abstract 1

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INTERIOR MEMBER FOR AIR BAG

[Scope of Claims for a Patent]

[Claim 1]

An interior member for an air bag in which a main body having an air bag swelling-out port is formed by a synthetic resin material and thereafter a cover body closing said air bag swelling-out port is integrally formed in accordance with a two-color molding by a synthetic resin material which is compatible with the synthetic resin of said main body, characterized in that a deformation restricting portion which is engaged with a mold face of a forming mold and restricts a deformation of the main body caused by a molding pressure applied at a time of molding the cover body is formed in a periphery of the air bag swelling-out port of said main body.

[Detailed Description of the Invention]

[0001]

[Technical Field Pertinent to the Invention]

The present invention relates to an interior member for an air bag, and more particularly to a deformation preventing structure of the interior member for the air bag in which a cover body of an air bag swelling-out port is integrally formed with a main body in accordance with a two-collar molding.

[0002]

[Prior Art]

In recent years, there has been provided an air bag for a front passenger seat and a so-called side air bag for improving a safety, and

in this case, the air bag is placed in an inner side of an interior member made of synthetic resin such as an instrument panel, a door trim or the like, and is swollen out into a passenger room from an air bag swelling-out port provided in this interior member. Further, generally, this air bag swelling-out port is closed by a cover body (an air bag cover) having a thin wall portion which is easily broken at a time when the air bag is swollen.

[0003]

Conventionally, the air bag cover mentioned above is manufactured as a separate body from the instrument panel or the like and is attached over an opening edge of the air bag swelling-out port by means of a screw fastening or the like, however, a lot of labor hour is required for manufacturing and assembling. Then, for example, in Japanese Unexamined Patent Publication No. 9-2187, there is proposed an interior member for an air bag in which the labor hour mentioned above can be solved by integrally molding the air bag cover with the main body of the interior member in accordance with a two-color molding.

[0004]

[Problem to be solved by the Invention]

However, there is a problem that an injection pressure is applied to a main body portion in a semisolid solution state in a peripheral edge of the air bag swelling-out port, at a time of injecting a material of the air bag cover into the air bag swelling-out port within a metal mold after injection molding a synthetic resin material constituting the main body of the interior member within the metal mold, whereby the main body portion is deformed, and a peripheral edge of the air bag swelling-out port of a finished product is deflected from a predetermined shape and

undulated.

[0005]

Accordingly, the present invention solves the problem mentioned above, and an object thereof is to provide an interior member for an air bag in which an improvement of appearance is intended by preventing a main body from being deformed at a time of two-color molding.

[0006]

[Means for Solving Problem]

In order to achieve the object mentioned above, in accordance with the present invention, there is provided an interior member (1) for an air bag in which a main body (11) having an air bag swelling-out port (12) is formed by a synthetic resin material and thereafter a cover body (2) closing the air bag swelling-out port (12) is integrally formed in accordance with a two-color molding by a synthetic resin material which is compatible with the synthetic resin of the main body (11), in which a deformation restricting portion (14) which is engaged with a mold face (62) of a forming mold (6) and restricts a deformation of the main body (11) caused by a molding pressure applied at a time of molding the cover body is formed in a periphery of the air bag swelling-out port of the main body (11). In this case, this deformation restricting portion can be constituted by a recess groove (14) engaged with a convex strip (62) formed on the mold face, or a convex strip (15) engaged with a recess groove (63) formed on the mold face.

[0007]

In accordance with the present invention, with respect to the main body which is in the semisolid solution state within the forming mold, at a time of two-color molding the cover body closing the air bag swelling-out

port within the air bag swelling-out port, a great molding pressure is applied to the main body portion in the peripheral edge of the air bag swelling-out port. In this case, since the main body is engaged with the mold face of the forming mold by the deformation restricting portion, the main body is not deformed even when the molding pressure is applied, and there is not generated the problem that the peripheral edge of the air bag swelling-out port is displaced from the predetermined shape and is undulated.

[0008]

In this case, reference numerals in parentheses mentioned above show a relation of correspondence to particular means described in embodiments mentioned below.

[0009]

[Mode for Carrying out the Invention]

(First Embodiment)

In Fig. 1, there is shown an enlarged perspective view of a front passenger seat side portion of an instrument panel 1 corresponding to one embodiment of an interior member for an air bag. The instrument panel 1 is made of a thermoplastic hard synthetic resin material such as a polypropylene (PP) or the like mixed with a rubber or a filler, and an approximately rectangular air bag swelling-out port 12 is formed on an upper face of a main body 11 thereof at a center position in a back and forth direction (an oblique vertical direction in Fig. 1). Further, this air bag swelling-out port 12 is closed by an air bag cover 2 made of a olefin-based thermoplastic elastomer (TPO) integrally formed in accordance with a two-color molding mentioned below. A cross section of the air bag swelling-out port 12 portion is shown in Fig. 2.

[0010]

In Fig. 2, an outer peripheral edge 21 of the air bag cover 2 is bent along a lower face of a peripheral edge of the air bag swelling-out port 12 in the instrument panel 11, and is welded to each other. Further, an outer peripheral surface of the air bag cover 2 is stepwise lowered in an entire periphery thereof, whereby a recess groove 22 is formed with respect to an opening peripheral surface of the air bag swelling-out port 12. A rib 23 extending along a front line (a left line in Fig. 2) of the air bag cover 2 and linearly protruding obliquely forward is formed on a back face of the front line of the air bag cover 2, and the rib 23 is covered with a retainer 231 made of metal, and is connected to a bracket 31 of an air bag case 3 positioned at the back of the air bag cover 2 by a bolt 41 and a nut 42. The air bag case 3 in which the air bag is received, is fixed to an insert member 13 of the instrument panel main body 11 via a bracket 32 by a bolt 43 and a nut 44.

[0011]

Back faces along three lines of the air bag cover 2 except the front line mentioned above are deep recessed in a direction of a front face, and a thin wall portion 24 which is broken at a time when the air bag is swollen out is formed with respect to the recess groove 22. Accordingly, in the case that the air bag is swollen, the thin wall portion 24 (Fig. 1) in three lines of the air bag cover 2 is broken, the air bag cover 2 is left open into a passenger room (the above in Fig. 2) around a portion near a root of the rib 23 corresponding to a hinge center, and the air bag is swollen out from the air bag swelling-out port 12. In this case, a recess groove 14 having a rectangular cross sectional shape is formed in an annular shape (Fig. 1) on a lower surface of the instrument panel

main body 11 in an outer position close to the portion of the air bag cover 2 to which the outer peripheral edge 21 is welded, in such a manner as to surround the outer peripheral edge 21, thereby forming a deformation restricting portion.

[0012]

The instrument panel 1 for the air bag as mentioned above is manufactured in accordance with a two-color molding described below. That is, in Fig. 3, a convex strip 52 having the same shape as that of the recess groove 22 mentioned above is formed on an outer periphery of a mold face in a slide type opposite mold 51 within an upper mold 5, an end face of a slide core 61 within a lower mold 6 comes in press contact with en end face of this convex strip 52, and an air bag cover molding space S1 and a main body molding space S2 in an outer side thereof are separated. A convex strip 62 having a predetermined height and formed in a rectangular cross sectional shape is formed on the mold face of the lower mold 6 so as to surround an outer side of the slide core 61, thereby protruding into the main body molding space S2. Then, the hard synthetic resin material is injected into the main body molding space S2, whereby the instrument panel main body 11 is molded.

[0013]

During the period that the hard synthetic resin material within the main body molding space S2 is yet in a semisolid solution state, subsequently as shown in Fig. 4, the slide core 61 is moved backward at a fixed amount, whereby the main body molding space S2 and the air bag cover molding space S1 are communicated. Then, in this state, a thermoplastic elastomer material which is compatible with the hard synthetic resin material mentioned above is injected into the air bag cover molding space S1. The

elastomer material fills up the air bag cover molding space S1, enters into a gap space S3 generated by the slide core 61 moving backward so as to form an outer peripheral edge 21 of the air bag cover 2, and is welded to the lower face of the instrument panel main body 11 in the semisolid solution state.

[0014]

In this case, as shown in Fig. 5, in accordance with an inflow (an arrow in the drawing) of the elastomer material into the gap space S3, a great injection pressure is applied to the instrument panel main body 11 in the semisolid solution state, each of the portions in the peripheral edges of the air bag swelling-out port 12 in the instrument panel main body 11 is deformed backward in correspondence to the applied pressure as shown by a chained line in Fig. 5. Accordingly, as listed up in the conventional problem, there is generated a problem that the peripheral edge of the air bag swelling-out port 12 is deflected from a predetermined shape and is undulated. In this case, in the present embodiment, as already described, since the convex strip 62 having the predetermined height is formed on the mold face of the lower mold 6, the recess groove 14 as already mentioned corresponding to the deformation restricting portion is formed on the back surface (the lower surface in Fig. 5) of the instrument panel main body 11 in the semisolid solution state by the convex strip 62, and a side surface 14a is engaged with a side surface 62a of the convex strip 62 so as to prevent the instrument panel main body 11 in the peripheral edge of the air bag swelling-out port 12 from being deformed backward against the injection pressure. As a result, the undulation phenomenon in the peripheral edge of the air bag swelling-out port 12 can be effectively solved.

[0015]

(Second Embodiment)

As the deformation restricting portion, the structure may be made such that a recess groove 63 having a rectangular cross sectional shape is provided on the mold face of the lower mold 6 as shown in Fig. 6, and a convex strip 15 formed in a rectangular cross sectional shape and having a side surface 15a engaged with a side surface 63a thereof is formed on a back surface of the instrument panel main body 11. In this case, the same effect as that of the first embodiment can be obtained. Further, in this case, since the thickness of the instrument panel main body 11 is not made thin, it is advantageous in strength.

[0016]

(Other Embodiments)

It is not always necessary that the cross sectional shape of the deformation restricting portion is formed in the rectangular cross sectional shape as in the first or second embodiment, and as far as the cross sectional shape has a surface engaging with the mold face of the metal mold and preventing the instrument panel main body portion in the peripheral edge of the air bag swelling-out port from being deformed backward, for example, a curved surface may be employed. Further, it is not necessary that the deformation restricting portion is continuously formed so as to surround the main body peripheral edge portion of the air bag swelling-out port, and the deformation restricting portion may be formed discretely with an interval.

[0017]

[Effect of the Invention]

As described above, in accordance with the interior member for the air bag on the basis of the present invention, it is possible to prevent

the main body from being deformed at a time of two-color molding and an improvement of an appearance can be intended.

[Brief Description of the Drawings]

[Fig. 1]

Fig. 1 is an enlarged perspective view of a front passenger seat side portion of an instrument panel for an air bag in accordance with a first embodiment of the present invention.

[Fig. 2]

Fig. 2 is a cross sectional view along a line II-II in Fig. 1.

[Fig. 3]

Fig. 3 is a cross sectional view of a metal mold at a time of molding the instrument panel for the air bag.

[Fig. 4]

Fig. 4 is a cross sectional view of the metal mold at a time of molding the instrument panel for the air bag.

[Fig. 5]

Fig. 5 is a cross sectional view of a main portion of the metal mold at a time of molding the instrument panel for the air bag.

[Fig. 6]

Fig. 6 is a cross sectional view of a main portion of a metal mold at a time of molding an instrument panel for an air bag in accordance with a second embodiment of the present invention.

[Description of Reference Numerals]

1 ... instrument panel for air bag,

11 ... instrument panel main body,

12 ... air bag swelling-out port,

14 ... recess groove,

15 ... convex strip,

2 ... air bag cover,

6 ... lower mold,

62 ... convex strip,

63 ... recess groove.

Abstract

[Problem To Be Solved]

An object is an improvement of appearance by preventing a main body from being deformed at a time of two-color molding.

[Solution]

An instrument panel 1 for an air bag for an air bag in which a main body 11 having an air bag swelling-out port 12 is formed by a hard synthetic resin material and thereafter an air bag cover 2 closing said air bag swelling-out port 12 is integrally formed in accordance with a two-color molding by a thermoplastic elastomer which is compatible with the hard synthetic resin material of said main body. A recessed groove 14 is formed in a periphery of the air bag swelling-out port 12 of said main body, this recessed groove 14 engaged with a convex strip of a mold face of a forming mold, and restricts a deformation of the main body 11 caused by a injection pressure applied at a time of molding the air bag cover.